

REMARKS / ARGUMENTS

Examiner Klimowicz is thanked for the thorough examination of the subject Patent Application. The claims have been carefully reviewed and amended, and are considered to be in condition for allowance.

The structure and method of the invention is for minimizing EME (Electromagnetic Emission) and the crosstalk between the signal lines which are used to write and read the tracks of magnetic disk drives. These signal lines are located on magnetic trace suspension assemblies which move above the magnetic disk drives. The structure and method utilize well-placed single and multiple crossovers on either or both of the lines used to read and write the tracks on magnetic disks. In addition, the structure and method utilize the parasitic capacitances between the write and read lines to couple beneficial voltages which cancel the unwanted crosstalk noise.

Reconsideration of the rejection of claims 1, 3-6, 19 and 21-24, under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement, is requested based on the following.

Independent claims 1 and 19 have been amended by removing the clauses added during the previous preliminary amendment in reply to the Decision on Appeal dated February 22, 2011. Similarly, reconsideration of dependent claims 3-6, and 21-24 which

depend on independent claims 1 and 19 respectively, is respectfully requested.

Independent claim 1 is shown below. Claims 1 and 19 were amended by adding the underlined phrase below in order to emphasize the canceling of crosstalk and EME via the halfway crossing point of the instant application.

1. A crosstalk and EME (electromagnetic emission) minimizing trace suspension assembly structure comprising:

multiple write lines which are crossed between a preamplifier connection point and slider write contact pads;

multiple read lines driven by preamplifier circuits;

said slider write contact pads, which connect said write lines to said trace suspension assembly structure;

slider read contact pads, which connect said read lines to said trace suspension assembly structure; and

multiple write lines driven by preamplifier circuits,

wherein said multiple write lines which are crossed between said preamplifier connection point and said slider write contact pads are used to cancel out time-delayed (transmission line effects) parts of said crosstalk and said EME,

wherein a single crossing point of said write lines between said preamplifier connection point and said slider write contact pads is placed halfway between said preamplifier connection point and said slider write contact pads, in order to cancel out said crosstalk and said EME,

. wherein said write lines have parasitic capacitance between the write lines and the read lines,

wherein said parasitic capacitances between the write lines and read lines are used to cancel crosstalk noise between said write lines and said read lines.

Reconsideration of the rejection of claims 1, 3-6, 19 and 21-24, under 35 U.S.C. 103(a), as being unpatentable over Carpenter et al. (WO 98/20485 A1) in view of Murata et al. (JP 06-342858 A), is requested based on the following.

In regard to the differences between Carpenter et al. in view of Murata, and the

instant application, there were two points to make. The first is that the stated objective of Carpenter et al. is “providing reduced susceptibility to electromagnetic interference and stray signal pickup”. Structurally, Carpenter solves its stated objective above by using, “a twisted wire transmission pair in order to provide self-shielding of one or multiple signal pairs against unwanted electromagnetic noise (EMI) or radio frequency interference (RFI). The stated objective of the instant application is to prevent interference from the trace assembly itself from interfering with units outside of the trace assembly. Structurally, the instant application solves this objective via a single crossing point of write lines between an preamplifier connection point and the slider write contact pads, which is placed halfway between the preamplifier connection point and the slider write contact pads.

Therefore, the instant application and Carpenter use different structures to solve different problems. In summary, the instant application solves the problem of preventing interference from the trace assembly itself from interfering with units outside of the trace assembly, while Carpenter solves the problem of protecting the trace assembly from interference from sources outside of the trace assembly. The title of Carpenter et al. contains the words “self-shielding”. On the other hand, independent claim 1 of the instant application, which is listed below, clearly states the purpose of the instant application which is “used to cancel out time-delayed (transmission line effects) parts of said crosstalk and said EME”.

1. A crosstalk and EME (electromagnetic emission) minimizing trace suspension assembly structure comprising:
multiple write lines which are crossed between a preamplifier connection point and slider write contact pads;

multiple read lines driven by preamplifier circuits;
said slider write contact pads, which connect said write lines to said trace suspension assembly structure;
slider read contact pads, which connect said read lines to said trace suspension assembly structure; and
multiple write lines driven by preamplifier circuits,
wherein said multiple write lines which are crossed between said preamplifier connection point and said slider write contact pads are used to cancel out time-delayed (transmission line effects) parts of said crosstalk and said EME,
wherein a single crossing point of said write lines between said preamplifier connection point and said slider write contact pads is placed halfway between said preamplifier connection point and said slider write contact pads, in order to cancel out said crosstalk and said EME,
wherein said write lines have parasitic capacitance between the write lines and the read lines,
wherein said parasitic capacitances between the write lines and read lines are used to cancel crosstalk noise between said write lines and said read lines.

Therefore, based on the stated different problems solved via different structural means (ie. Twisted pair wires versus write lines crossed at their midpoint), the instant application is not obvious using Carpenter et al. alone.

The second point to make is that the Murata patent discloses a "crossed-wire" pair of traces to minimize all magnetic fields that emanate from two parallel lines. By reducing the magnetic fields that emanate from any pair of lines, the disturbance to other circuits are minimized. The instant application also crosses a pair of "write-lines" and "read-lines" with a similar purpose. However, the instant application, more specifically is primarily concerned about the neighboring read-lines on the trace suspension. The instant application would like to balance the capacitance between each write line and each read line. One method for achieving this is to cross the read lines (on the same plane) so that the average distance from each write line to each read line is similar. Therefore even if the

two write lines carry completely unrelated signals, each read line (R+ and R-) gets an equal dose of the disturbance on each write line. Any differential detection on the read lines will therefore eliminate the pickup (mostly capacitive) on these lines.

In summary, while the Murata patent discloses "magnetic fields emanating from a pair of lines" or perhaps one can infer "magnetic fields picked up by a pair of lines", the instant application is concerned with electric fields (hence capacitive pickup). The instant application balances the electric field pickup on each read line so that once you subtract the two, you eliminate the pickup. As a result, in the instant application, dependent claims 5 and 6 have been canceled and made part of independent claim 1, and dependent claims 23 and 24 have been canceled and made part of independent claim 19. These independent claim amendments emphasize the fact that Murata solves magnetic noise problems while the instant application uses electric fields and capacitance to solve electrical noise problems. The amended independent claim 1, with the pertinent clauses from dependent claims 5 and 6 underlined, is shown below.

1. A crosstalk and EME (electromagnetic emission) minimizing trace suspension assembly structure comprising:
 - multiple write lines which are crossed between a preamplifier connection point and slider write contact pads;
 - multiple read lines driven by preamplifier circuits;
 - said slider write contact pads, which connect said write lines to said trace suspension assembly structure;
 - slider read contact pads, which connect said read lines to said trace suspension assembly structure; and
 - multiple write lines driven by preamplifier circuits,wherein said multiple write lines which are crossed between said preamplifier connection point and said slider write contact pads are used to cancel out time-delayed (transmission line effects) parts of said crosstalk and said EME,

wherein a single crossing point of said write lines between said preamplifier connection point and said slider write contact pads is placed halfway between said preamplifier connection point and said slider write contact pads, in order to cancel out said crosstalk and said EME,

wherein said write lines have parasitic capacitance between the write lines and the read lines,

wherein said parasitic capacitances between the write lines and read lines are used to cancel crosstalk noise between said write lines and said read lines.

Based on the fact that Carpenter and the instant application solve different problems (instant application eliminates noise emanating from trace assembly and Carpenter protects circuits from outside noise), and that Murata does not solve electric field noise using capacitances, the instant application is not obvious using Carpenter et al. in view of Murata. The allowance of independent claims 1 and 19 is respectfully requested. In addition, the allowance of dependent claims 3-4 and 21-22, which depend on claims 1 and 19 respectively, is also requested.

It is requested that should there be any problems with this Amendment, please call the undersigned Attorney at (845) 452-5863.

Respectfully submitted,

A handwritten signature in black ink, appearing to be 'SBA', with a long horizontal line extending to the right.

Stephen B. Ackerman, Reg. No. 37,761